

Warmup!

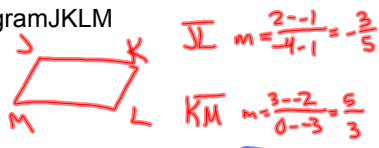
Give the most specific name for the parallelogram JKLM

J(-4,2)

K(0,3)

L(1,-1)

M(-3,-2)



$$\overline{JK} \quad m = \frac{2-3}{-4-0} = -\frac{1}{4}$$

$$\overline{KM} \quad m = \frac{3-(-2)}{0-(-3)} = \frac{5}{3}$$

Diagonals  $\perp$  RhombusDiagonals  $\cong$  Rect

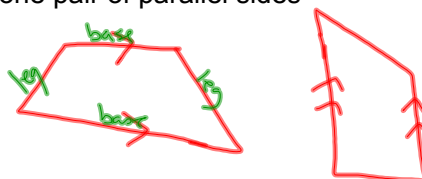
$$JK = \sqrt{(5)^2 + (-3)^2} = \sqrt{34}$$

$$KM = \sqrt{3^2 + 5^2} = \sqrt{34}$$

Square  $\perp \cong$  diagonals

## 8-6 Trapezoids

trapezoid--quadrilateral with exactly one pair of parallel sides

parallel sides are bases  
non-parallel sides legs

isosceles trapezoid-- congruent legs

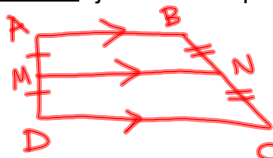


Theorem 8.18--Both pairs of base angles of an isosceles trapezoid are congruent

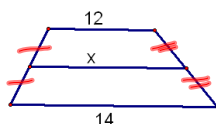
Theorem 8.19--The diagonals of an isosceles trapezoid are congruent



Median--joins the midpoints of the legs

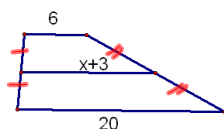
Theorem 8.20--The median of a trapezoid is parallel to the bases and  $= \frac{1}{2}$  the sum of the bases

$$MN = \frac{1}{2}(AB + DC)$$



$$x = \frac{1}{2}(12 + 14)$$

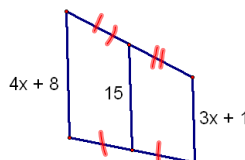
$$x = 13$$



$$x+3 = \frac{1}{2}(6 + 20)$$

$$x+3 = 13$$

$$x = 10$$



$$15 = \frac{1}{2}(4x + 8 + 3x + 1)$$

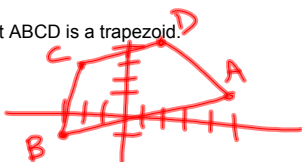
$$15 = \frac{1}{2}(7x + 9)$$

$$30 = 7x + 9$$

$$3 = x$$

Verify that ABCD is a trapezoid.

A(5, 1)  
B(-3, -1)  
C(-2, 3)  
D(2, 4)



Compare the slopes of all 4 sides

$$\overline{AB} \quad m = \frac{1 - (-1)}{5 - (-3)} = \frac{2}{8} = \frac{1}{4} \quad \overline{BC} \quad m = \frac{3 - (-1)}{-2 - (-3)} = \frac{4}{1}$$

$$\overline{CD} \quad m = \frac{4 - 3}{2 - (-2)} = \frac{1}{4} \quad \overline{AD} \quad m = \frac{4 - 1}{2 - 5} = \frac{3}{-3} = -1$$

ABCD is a trap b/c  $\overline{AB} \parallel \overline{CD}$  +  $\overline{BC} \nparallel \overline{AD}$

What are the endpoints of the median?

A(5, 1)  
B(-3, -1)  
C(-2, 3)  
D(2, 4)

Midpts of  $\overline{BC} + \overline{AD}$   
(legs)

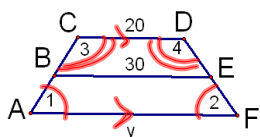
$$M\left(\frac{-3 + (-2)}{2}, \frac{-1 + 3}{2}\right) = M\left(-\frac{5}{2}, 1\right)$$

$$N\left(\frac{5 + 2}{2}, \frac{1 + 4}{2}\right) = N\left(\frac{7}{2}, \frac{5}{2}\right)$$

Is it isosceles?

$$BC = \sqrt{(-3 - (-2))^2 + (-1 - 3)^2} = \sqrt{1 + 16} = \sqrt{17}$$

$$AD = \sqrt{(5 - 2)^2 + (1 - 4)^2} = \sqrt{9 + 9} = \sqrt{18} \quad \text{No legs} \neq$$



Isosceles trapezoid ACDF

$$m\angle 1 = 3x + 5$$

$$m\angle 3 = 6x - 5$$

$$9x = 180$$

$$x = 20$$

$$30 = \frac{1}{2}(y + 20)$$

$$60 = y + 20$$

$$40 = y$$

HW

p442-443

9, 11, 13-19, 22, 25